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(54) Title: MOLECULAR CORRELATES OF COCAINE ADDICTION AND METHODS FOR THEIR USE

(57) Abstract: The present invention provides compositions and methods useful in the diagnosis and treatment of addictive disorders including cocaine addiction. Target genes and their expression products are identified based on their differential expression in subjects affected by addictive disorders in comparison with control subjects. In another aspect, the invention also provides methods for evaluating candidate drugs to predict their therapeutic efficacy. The invention also provides methods for predicting whether a compound will be addictive. Compositions of the invention include arrays, computer-readable mediums, and kits for use in the methods of the invention.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, EMBASE, MEDLINE, INSPEC, COMPENDEX, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | WO 02/080758 A (IRM LLC; WALKER, JOHN, R; SELF, DAVID, W; FRANTZ, KYLE, J) 17 October 2002 (2002-10-17) claims 1-89; examples 1,2 | 1-53 |
| X | LOFTIS JENNIFER M ET AL: "Cocaine treatment- and withdrawal-induced alterations in the expression and serine phosphorylation of the NR1 NMDA receptor subunit." PSYCHOPHARMACOLOGY, vol. 164, no. 4, December 2002 (2002-12), pages 349-359, XP001204966 ISSN: 0033-3158 abstract; figures 1-4 | 1-53 |
| -/-- | | |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | HASENKAMP W M ET AL: "REGION SPECIFIC ALTERATIONS IN IONOTROPIC GLUTAMATE RECEPTOR SUBUNITS OF COCAINE OVERDOSE VICTIMS." SOCIETY FOR NEUROSCIENCE ABSTRACT VIEWER AND ITINERARY PLANNER, vol. 2002, 2002, pages Abstract No. 897.14 URL-http://sf, XP001205157 & 32ND ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE; ORLANDO, FLORIDA, USA; NOVEMBER 02-07, 2002 abstract | 1-53 |
| X | LU L ET AL: "TIME - DEPENDENT MOLECULAR ALTERATIONS DURING ABSTINENCE FROM COCAINE SELF - ADMINISTRATION." SOCIETY FOR NEUROSCIENCE ABSTRACT VIEWER AND ITINERARY PLANNER, vol. 2002, 2002, pages Abstract No. 501.18 URL-http://sf, XP001204967 & 32ND ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE; ORLANDO, FLORIDA, USA; NOVEMBER 02-07, 2002 abstract | 1-53 |
| X | HASENKAMP W M ET AL: "Expression profile of ventral tegmental area in human cocaine overdose tissue" SOCIETY FOR NEUROSCIENCE ABSTRACTS, vol. 27, no. 2, 2001, page 2598, XP001204960 & 31ST ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE; SAN DIEGO, CALIFORNIA, USA; NOVEMBER 10-15, 2001 ISSN: 0190-5295 abstract | 1-53 |
| P,X | TANG WEN-XUE ET AL: "Molecular profiling of midbrain dopamine regions in cocaine overdose victims." JOURNAL OF NEUROCHEMISTRY, vol. 85, no. 4, May 2003 (2003-05), pages 911-924, XP001205156 ISSN: 0022-3042 the whole document | 1-53 |

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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|------------|--|-----------------------|
| P,X | <p>BACKES ERIC ET AL: "Discrete cell gene profiling of ventral tegmental dopamine neurons after acute and chronic cocaine self-administration." JOURNAL OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS, vol. 307, no. 2, November 2003 (2003-11), pages 450-459, XP001204962 ISSN: 0022-3565 abstract</p> | 1-53 |
| P,X | <p>YUFEROV VADIM ET AL: "Differential gene expression in the rat caudate putamen after "binge" cocaine administration: Advantage of triplicate microarray analysis." SYNAPSE (NEW YORK), vol. 48, no. 4, 15 June 2003 (2003-06-15), pages 157-169, XP009043512 ISSN: 0887-4476 the whole document</p> | 1-53 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

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| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|---|---|---------------------|----------------------------|---------------------|
| WO 02080758 | A | 17-10-2002 | WO 02080758 A2 | 17-10-2002 |